

15th Annual First Nations Launch

April 26-28, 2024
Kenosha & Kansasville, WI



ARTEMIS
STUDENT
CHALLENGES

nasa.gov/stem/artemis.html



Partner

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Meet the Team

■ Wisconsin Space Grant Consortium

- Kevin Crosby, Director,
- Christine Bolz, Assistant Director
- Rob Cannon, FNL Program Manager
- Megan Goller, Accounts Assistant
- Connie Engberg, Project Support Assistant

kcrosby@carthage.edu

cbolz@carthage.edu

rcannon@carthage.edu

mgoller@carthage.edu

cengberg@carthage.edu

■ First Nations Launch Administrative Team

- Frank Nobile, Technical Coordinator, Wisconsin Tripoli
- Mark Abotossaway, Structures Engineer – Blue Origin
- Bob Justus, Illinois Tripoli

maxq3@aol.com

mark.a.abotossaway@gmail.com

bob@mhbofni.com

■ NASA

- Wendi Laurence, Activity Manager - Guardians of Honor
- Theresa Martinez, Kennedy Space Center



What is “First Nations Launch”?

- A competition offered to Tribal Colleges and Universities (TCU), Native American-Serving Nontribal Institutions (NASNTI), as well as active American Indian Science and Engineering Society (AISES) collegiate chapters the opportunity to demonstrate engineering and design skills through direct application in high-power rocketry.
- The competition requires teams of undergraduate students to conceive, design, fabricate and compete with high power rockets.
- The restrictions on rocket motors and dimensions are limited so that knowledge, creativity and imagination of the students are challenged.
- The end result is a great aerospace learning experience unique to the Native American communities.





NASA Artemis Student Challenge: First Nations Launch





Competition Weekend

- April 26, 2024
 - Carthage College in Kenosha, WI
 - Welcome Breakfast
 - Rocket Fair
 - Motor Build Workshop
 - Breakout Sessions
 - Final Safety Inspections
 - All: Rockets
 - Mars: Drones
 - Oral Presentations
- April 27, 2024
 - Launch Day at Richard Bong Recreational Area in Kansasville, WI
 - Closing Banquet at Carthage College in Kenosha, WI
- April 28, 2024
 - Rain Date





2024 First Nations Launch Teams

- 24 NASA Sponsored Teams
 - *International Teams
- 4-6 members per team on average

Moon & Mars Challenges

- NOI Due
 - October 20, 2023
- Proposal and Preliminary Budget Due
 - December 11, 2023
- Kick-Off Meeting
 - November 1, 2023

Gateway Challenge

- NOI Due
 - December 18, 2023
- Proposal and Preliminary Budget Due
 - January 22, 2024
- Kick-Off Meeting
 - January 3, 2024





Launch 2 Learn (L2L): Introductory Rocket Workshop

In-Person @ Carthage College (max 15 participants)

- Recommended for Gateway Challenge/New Teams
 - Up to three individuals maximum per school (one advisor, two students)
 - Travel, lodging, and most meals are provided
 - Workshop Materials provided:
 - Rocket kit, motor, and Tripoli Rocketry Association Level 1 Certification (pending successful certification launch)

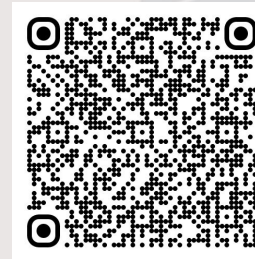
Virtually (max 30 participants)

- Up to three individuals maximum per school (one advisor, two students)
- Rocket kit and supplies provided by FNL
- Motor and Tripoli Rocketry Association Level 1 Certification supplies at TRA Certification Launch

Submit a Notice of Intent to Compete: <https://spacegrant.carthage.edu/about/login>

REGISTER for the L2L Workshop:

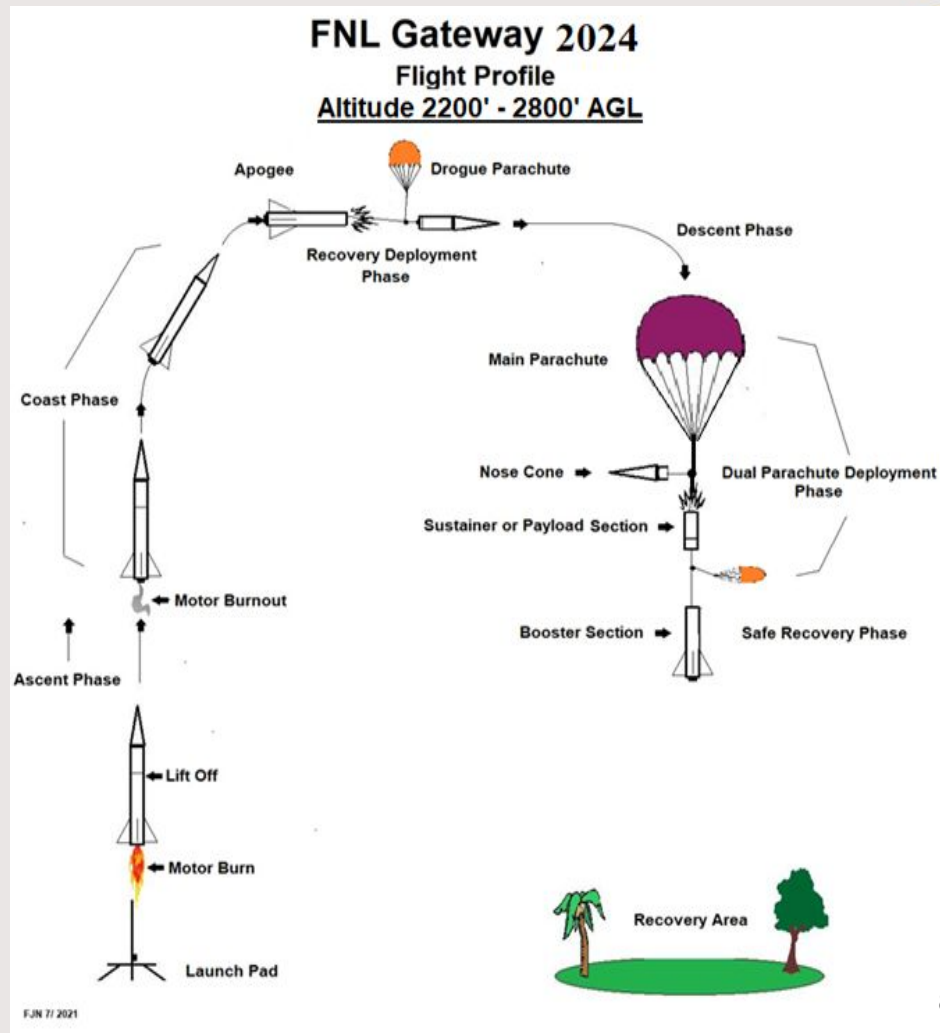
<https://spacegrant.carthage.edu/first-nations-launch/launch-2-learn-rocket-certification-workshop>





Gateway Challenge

- Teams shall design and construct a dual deploy high-power rocket from the following list of kits:
 - Loc Precision “YANK Iris”
 - Loc Precision “EZI 65”
 - Loc Precision “Mystic Buzz”
- Teams may customize their kit with special add-ons provided by the manufacturer
- Pyro energetics of Jolly Logic altimeter shall be used for main deployment recovery
- There is no payload/challenge associated with this challenge, with focus being on the safe and complete selection, simulation, procurement, assembly/fabrication, and flight of the kit rocket.
- The flight shall be stable and reach an apogee between 2200' - 2800' AGL.





Gateway Challenge

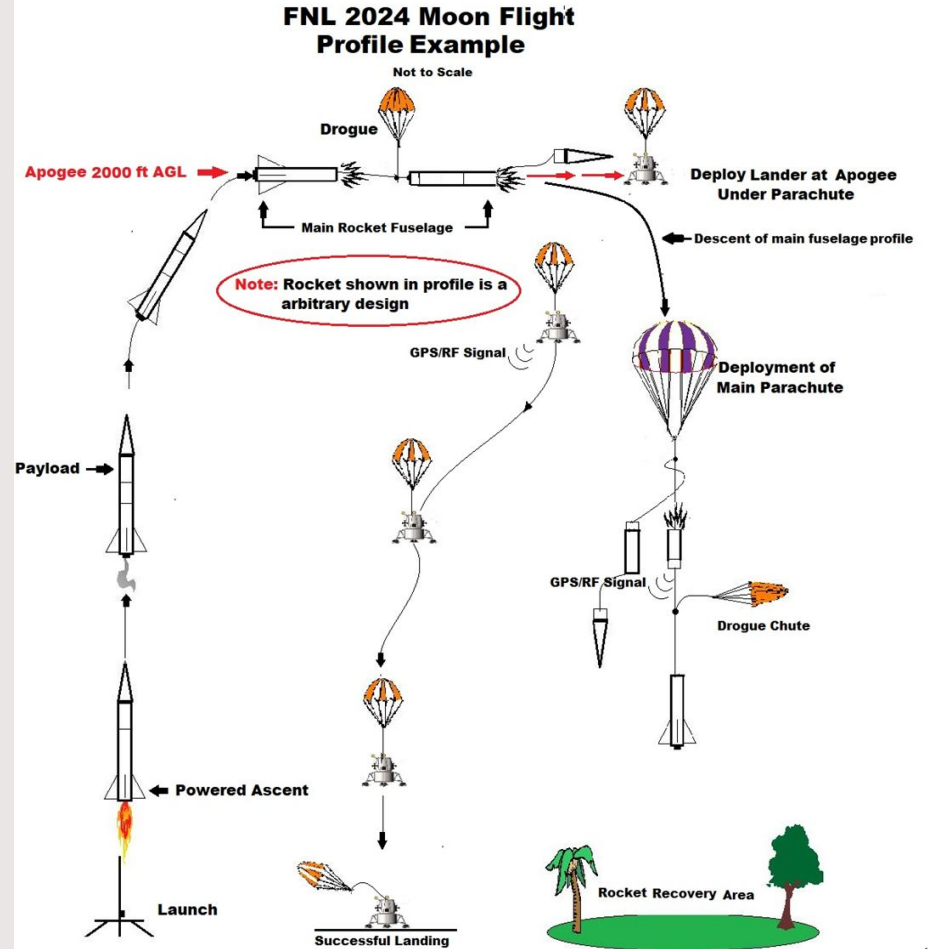
- When ordering your kit, make sure to include the following components:
 - E-bay module
 - 38mm motor adapter
- Two motors have been preselected per kit





Moon Challenge

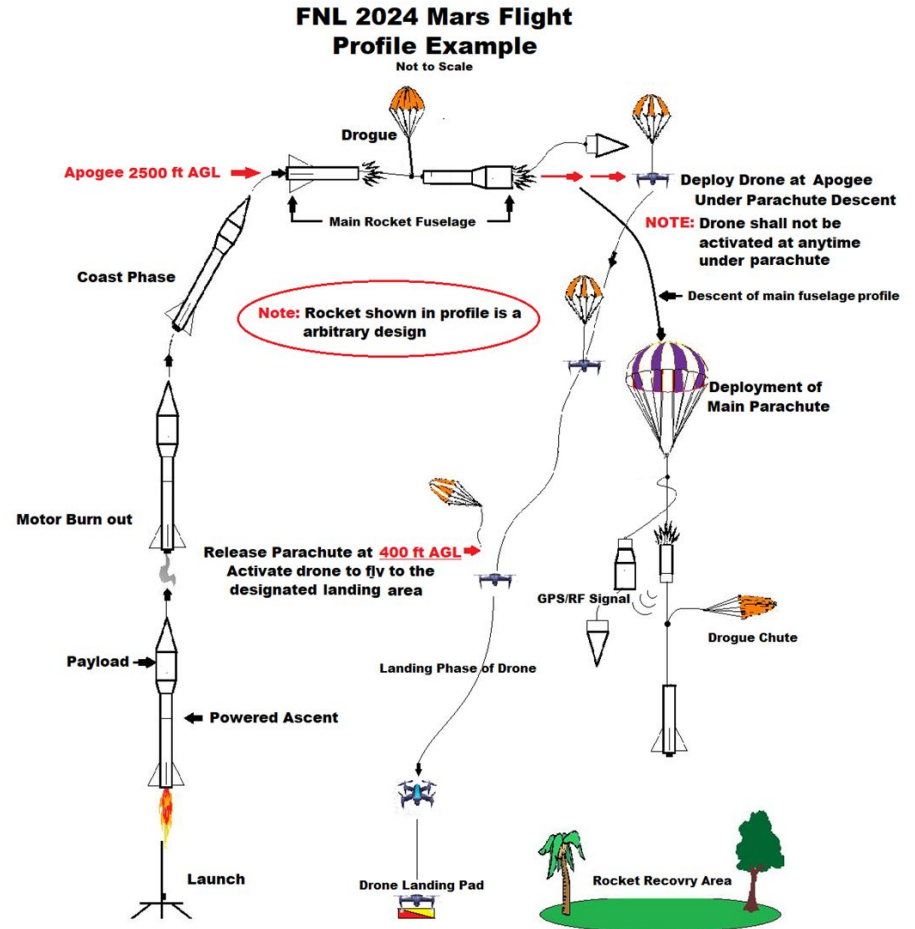
- Teams shall design, test, and fabricate a rocket that will air deploy a lander with a fabricated retractable payload chassis at apogee.
- The payload chassis must be equipped with a recovery device (streamer, parachute), camera, and GPS System/tracking device (RF, audible).
- The rocket flight shall be stable and reach an apogee of 2000' AGL.





Mars Challenge

- Teams are required to design, test, and fabricate a rocket that will air deploy a drone with a fabricated retractable air frame payload with size and weight limitations designed to deploy at apogee and return safely to the ground under control.
- The drone payload must descend under drone parachute until it reaches 400' AGL, wherein the drone parachute will release and a TRUST certified drone pilot will pilot the drone to a predetermined landing zone.
- The rocket flight shall be stable and reach an apogee of 2500' AGL.





Competition Summary

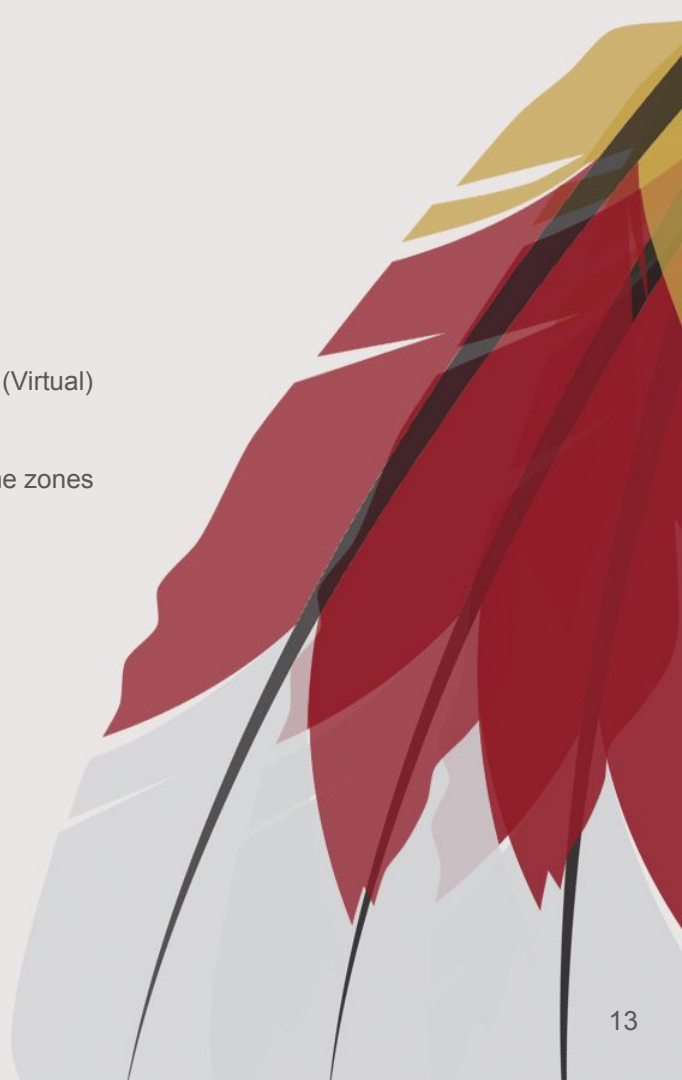
- Moon/Mars projects are judged on:
 - Written design reports
 - Virtual presentations (including launch weekend presentation)
 - Launch day flight/challenge performance
- These coincide with project milestones:
 - Proposal, PDR, CDR, FRR and PLAR
- Bonus points may be earned through outreach efforts
- An example of one item (among dozens of items scored on launch weekend) include:
 - Electronic payload bays are judged on neatness and simplicity at launch weekend





Supplied by WSGC to Teams

- Marketing/Recruitment Materials
 - Posters and Postcards
- Rocketry Workshop (Up to 3 members per team)
 - Level 1 Rocketry Workshop during October (in-person at Carthage College) and January (Virtual)
- Project Travel Award of \$4000
 - Reimbursements issued through Carthage College
 - Additional travel funds for teams traveling from Mountain, Pacific, Hawaiian, or Alaska time zones
- Two (2) Rocketry Reference Books (New College/Universities)
 - Modern Rocket Design and Construction
 - Modern High Powered Rocketry 2
- Report Feedback
 - Teams will receive report feedback 1 week prior to next report
- Low-Powered Rocket for Demo Flight
 - Each team to fly low-powered demo flight
- Motors (1) and Casing at Competition
 - Competition motor and a motor build workshop during Competition Launch
- Ejection Charges at Competition
- Hotel Accommodations Launch Weekend
- Max three (3) rooms for three (3) nights at select hotel
- Select Meals Launch Weekend
 - Friday: breakfast, lunch and heavy appetizers in the evening
 - Saturday: breakfast, lunch and dinner





Scoring Breakdown for Moon/Mars Teams

Competition Proposal	Written Report	5 pts	75 pts overall
Preliminary Design Review (PDR)	Written Report	15 pts	
PDR Presentation w/ judges	Virtual Presentation	5 pts	
Critical Design Review (CDR)	Written Report	15 pts	
CDR Presentation w/ judges	Virtual Presentation	5 pts	
Flight Readiness Review (FRR)	Written Report	15 pts	
FRR Virtual Safety Inspection	Virtual Presentation	5 pts	
Post-Launch Assessment Review Report (PLAR)	Written Report	10 pts	
Launch Weekend Oral Flight Readiness Presentation	Oral Presentation	5 pts	5 pts
Launch Weekend - Mission Performance		10 pts	20 pts overall
Launch Weekend - Challenge		10 pts	
TOTAL		100 pts	
Conduct an Education Outreach Project	BONUS	Up to 10 pts	
Submit Education/Public Outreach Form			
Submissions received after 11:59 pm Central on the due date will receive a deduction of 20% for each day they are late			



Design Reports Overview

- Purpose:
 - To communicate the engineering and design effort involved
 - To perform analysis of predicted performance
 - To compare actual to predicted performance
 - To SHOW the design and construction (pictures, diagrams, etc.)
- Reports are due when posted on website calendar:
 - <https://spacegrant.carthage.edu/first-nations-launch/calendar>
- Must use the Report / Presentation templates:
 - <https://spacegrant.carthage.edu/first-nations-launch/rubric/>
- There are 5 reports and 3 presentations for the year





2023-2024 FNL Calendar

<https://spacegrant.carthage.edu/first-nations-launch/calendar/>

- Sep 1, 2023 Announcement of Opportunity
- Sep 12, 2023 Informational Meeting @ 4:00 pm CDT (Zoom)
- Sep 25, 2023 Launch 2 Learn Registration
(Level 1 Rocket Certification Workshop @ Carthage College Nov. 4-5, 2023)
w/Non-Binding Notice of Intent (NOI) to Compete Due
- Oct 10, 2023 Informational Meeting @ 4:00 pm CDT (Zoom)
- Oct 20, 2023 Visit FNL at Booth #1538 during the AISES Conference <https://conference.aises.org/>
- Oct 20, 2023 Non-binding Notice of Intent to Compete Due (Moon/Mars)
Early Bird Non-binding Notice of Intent to Compete Due (Gateway)
- Oct 27, 2023 Award Announcement (Moon/Mars/Gateway)
- Oct 31, 2023 TRA/NAR Mentor Webinar @ 4:00 pm CDT (Zoom)
- Nov 1, 2023 Kick-off Meeting @ 4:00 pm CDT (Zoom) (Moon/Mars)
- Nov 4-5, 2023 Launch 2 Learn Level I Rocket Certification Workshop @ Carthage College (registration required)
- Nov 7, 2023 Proposal, Budget, and Design Review Development Webinar @ 4:00 pm CST (Zoom) (Moon/Mars)
- Nov 9, 2023 FNL Office Hours @ 1:00 - 3:00 pm CDT (Zoom)
- Nov 13, 2023 Award Acceptance Material Due (Moon/Mars)
- Nov 14, 2023 Payloads Webinar @ 4:00 pm CST (Zoom)
- Nov 21, 2023 Project Management Webinar @ 4:00 pm CST (Zoom)
- Nov 28, 2023 Introduction to RockSim Webinar @ 4:00 pm CST (Zoom)
- Nov 30, 2023 FNL Office Hours @ 1:00 - 3:00 pm CST (Zoom)



2023-2024 FNL Calendar

<https://spacegrant.carthage.edu/first-nations-launch/calendar/>

- Dec 11, 2023 Proposal Due (Moon/Mars)
Preliminary Budget Due (Moon/Mars)
Flysheet Due (Moon/Mars)
RockSim Due (Moon/Mars)
- Dec 12, 2023 Build & Assembly Techniques Webinar @ 4:00 pm CST (Zoom)
- Dec 14, 2023 FNL Office Hours @ 1:00 - 3:00 pm CST (Zoom)
- Dec 18, 2023 Notice of Intent to Compete Due (Gateway)
Request for Virtual Rocketry Workshop Due
- Dec 22, 2023 Award Announcement (Gateway)
- Jan 3, 2024 Kick-off Meeting @ 4:00pm CST (Zoom) (Gateway)
- Jan 4, 2024 FNL Office Hours @ 1:00 - 3:00 pm CST (Zoom)
- Jan 9, 2024 Gateway Project Management Webinar @ 4:00 pm CST (Zoom)
- Jan 10, 2024 Launch 2 Learn Kit Reveal @ 4:00 pm CST (Zoom)
- Jan 15, 2024 Award Acceptance Material Due (Gateway)
- Jan 16, 2024 Avionics/Altimeters Webinar @ 4:00 pm CST (Zoom)
- Jan 18, 2024 FNL Office Hours @ 1:00 - 3:00 pm
- Jan 20-21, 2024 Launch 2 Learn Rocket Certification Virtual Workshop (Registration Required)
- Jan 22, 2024 Preliminary Design Review (PDR) Report Due (Moon/Mars)
Budget Due (Gateway)
Flysheet Due (Gateway/Moon/Mars)
RockSim Due* (Gateway/Moon/Mars)
Flight Demo Due - Upload rocket demo flight video on Facebook and/or Twitter



2023-2024 FNL Calendar

<https://spacegrant.carthage.edu/first-nations-launch/calendar/>

Jan 24, 2024 Recovery Webinar @ 4:00 pm CST (Zoom)

Jan 30-Feb 2, 2024 PDR Virtual Presentations (Zoom) (Gateway/Moon/Mars)

Feb 5, 2024 Final Requests Due to Change to Different Competition Challenge

Feb 19, 2024 Patch Design Due

Feb 20, 2024 Advisor/Mentor Meeting @ 4:00 pm CST (Zoom)

Feb 22, 2024 FNL Office Hours @ 1:00 - 3:00 pm CST (Zoom)

Feb 26, 2024 Critical Design Review (CDR) Report Due (Moon/Mars)

Flysheet Due (Gateway/Moon/Mars)

RockSim Due (Gateway/Moon/Mars)

Final Motor Selection Due (Gateway/Moon/Mars)

Official Team Roster & Lodging List Due (Gateway/Moon/Mars)

Team Bio Due (Gateway/Moon/Mars)

Team Photo Due (Gateway/Moon/Mars)

All Team Member Registration on WSGC Website & FNL Application Due (Gateway/Moon/Mars)

Feb 29, 2024 FNL Office Hours @ 1:00 - 3:00 pm CST (Zoom)

Mar 4, 2024 Reimbursements Due (First payout) (Gateway/Moon/Mars)

Mar 5-8, 2024 CDR Virtual Presentations/Initial Virtual Safety Inspection with WSGC (Zoom)
(Gateway/Moon/Mars)

Mar 14, 2024 FNL Office Hours @ 1:00 - 3:00 pm CDT (Zoom)

Mar 26, 2024 Launch Operations Webinar @ 4:00 pm CDT (Zoom)

Mar 28, 2024 FNL Office Hours @ 1:00 - 3:00 pm CDT (Zoom)



2023-2024 FNL Calendar

<https://spacegrant.carthage.edu/first-nations-launch/calendar/>

- Apr 1, 2024 Flight Readiness Review (FRR) Report Due* (Moon/Mars)
Flysheets Due* (Gateway/Moon/Mars)
RockSim Due* (Gateway/Moon/Mars)
Educational Outreach Forms Due* (Gateway/Moon/Mars)
- Apr 8-12, 2024 Final Virtual Safety Inspection with Tripoli Rocketry Association (Zoom) (Gateway/Moon/Mars)
- Apr 11-14, 2024 Student Launch Initiative (Next Step Award 2023)
 - Apr 16, 2024 Advisor/Mentor Meeting @ 4:00 pm CDT (Zoom)
 - Apr 22, 2024 Oral Presentations PPT Due (Gateway/Moon/Mars)
 - Apr 25, 2024 Teams Arrive in Wisconsin
 - Apr 26, 2024 Welcome Breakfast/Competition Kick-off @ 8:00 am CDT - Carthage College, Kenosha, WI
Activities planned to include: Team Workday, Motor Build Workshop, Breakout Sessions, Final Rocket Safety Inspections, Final Drone Safety Inspections (Mars only), Oral Presentations
 - Apr 27, 2024 Launch Day @ 7:30 am – 3:00 pm CDT – Richard Bong Recreational Park, Kansasville, WI
Closing Banquet @ 6:30 pm CDT – Carthage College
 - Apr 28, 2024 Launch Rain Date
- May 13, 2024 Final Reimbursements Due*
Post Launch Assessment Review (PLAR) Report Due* (Gateway/Moon/Mars)
2-3 Team Project Photos Due*
- Jun 1, 2024 Notification of Winners
- Jun TBD, 2024 RockOn! 2024 @ Wallops Flight Facility (Moon Next Step Award 2024)
- Summer TBD, 2024 Grand Prize Trip to a NASA Center (Moon and Mars Challenge Grand Prize Winners)



Advisor Support

- New Advisor Mentorship
 - Can pair up new with veteran advisors
- Team Outreach Efforts
 - Can provide ideas and support for outreach activities
- Team NAR/TRA Rocketry Mentor (required)
 - Will assist in finding your local rocketry club/precinct
- Next Step Opportunities
 - NASA Student Launch
 - NASA RockOn!
 - Spaceport America Cup





Additional Resources

■ FNL Website

- <https://spacegrant.carthage.edu/fnl>
 - Tools and Tips
 - Calendar
 - FAQ
 - Application Process
 - Report Template and Scoring Rubrics
 - Patch Contest
 - Competition Prizes
 - Awards
 - History

■ Instructional Videos/Webinars

- <https://spacegrant.carthage.edu/first-nations-launch/rocket-instructional-videoswebinars/>





Any Questions?

